

# PATENT SPECIFICATION

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DRAWINGS ATTACHED

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## (54) IMPROVEMENTS IN OR RELATING TO TYRE MANUFACTURING APPARATUS

(71) We, CONTINENTAL GUMMI-WERKE AKTIENGESELLSCHAFT, of Continental-Haus/Postfach 169, 3000 Hannover, Germany, a German Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to an apparatus for shifting annular rubberised parallel cord fabric bands, particularly tyre carcass bands, on to a tyre building drum, the apparatus having an auxiliary drum for receiving the fabric bands, which is arranged co-axially with the tyre building drum and can be driven synchronously with it and from which the fabric bands can be transferred to the tyre building drum, wherein the auxiliary drum is frusto-conical, its largest diameter being adjacent the tyre building drum and approximately corresponds to the external diameter of the tyre building drum.

In known forms of apparatus of this kind, the auxiliary drum is made cylindrical over the main part of its length. Only in the transfer region between the auxiliary drum and the building drum is there a steeply frusto-conical section which forms the frictional connection between the tyre building drum and the auxiliary drum which is driven by it. In order that the carcass bands can be transferred from the auxiliary drum to the building drum, rotatably-mounted abutment members with their axes inclined to the drum's axial plane which passes through the members centres are provided which, during the rotation of the building drum and of the auxiliary drum, exert a force which acts in an axial direction and correspondingly influences the fabric band which is to be transferred.

The invention is based upon the problem of improving this kind of apparatus in such a way that special tools for shifting fabric bands from the auxiliary drum to the tyre building drum are unnecessary and so that

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a fabric band formed on the auxiliary drum moves directly from one drum to the other because of the rotary movement of the two drums. 50

In order to solve this problem, in accordance with the invention, an apparatus for placing annular rubberised parallel cord fabric bands, particularly carcass bands, on a tyre building drum, which comprises an auxiliary drum, for receiving the fabric bands which is mounted co-axially with respect to a tyre building drum and is arranged to be driven synchronously with it, a major part of the axial length of the auxiliary drum being frusto-conical having its radially outer surface inclined at an angle of up to 5° to the axis and diverging in the axial direction towards the tyre building drum. Preferably, the radially outer surface of the auxiliary drum forms an angle of from 1° to 3° with respect to the drum axis. Further, the auxiliary drum preferably is made frusto-conical over its entire axial extent. 70

The invention is based on the consideration that, in the flat band method of building a tyre, a so-called creeping effect takes place if a slightly frusto-conical configuration is imposed on the band members. Consequently, it is merely necessary to make the auxiliary drum slightly frusto-conical in order to secure the benefits of this invention. The fabric band located on the building drum undergoes axial movement during the rotation of the two drums, so that the fabric band passes from the auxiliary drum to the building drum without any additional assistance. 80

An embodiment of the invention is shown by way of example in the accompanying drawing. This shows in side view a tyre building machine and an auxiliary drum associated with it. 85

A tyre building drum 1 is arranged on the free end of a shaft 2, which is rotatably mounted in a bearing support 3. 90

An auxiliary drum 4 consists of a plurality of bars 5 extending in axial planes of

the drum arranged to form the circumference of the drum and connected to a shaft 6 by means of spokes. This shaft 6 is rotatably mounted upon an axially-movable carriage 7. Consequently, the auxiliary drum 4 can move towards the tyre building drum 1 and can thus be brought into a position where it is adjacent this drum, in which the free ends of the shafts 2 and 6 can be coupled together. By the coupling indicated at 8, the auxiliary drum 4 undergoes rotation when the tyre building drum 1 is being driven from the bearing support 3. Both drums thus rotate synchronously.

The bars 5 are so secured that they form an angle  $\alpha$  of approximately  $2^\circ$  with the shafts 2 and 6. The auxiliary drum 4 is thus given a slightly frusto-conical shape, so that it diverges in the direction towards the building drum 1.

If the carcass band indicated at 9, which in known manner consists of rubberised parallel cord fabric for example comprising textile cords or wires, is to be drawn on to the tyre building drum 1, it is first pushed on to the auxiliary drum 4. Then, after the auxiliary drum has been put into the position shown in the drawing, its rotary movement is caused by means of the coupling 8. If a predetermined number of revolutions per second is attained, the fabric band 9 moves itself in the direction of the arrow 10 on to the tyre building drum 1.

After the fabric band 9 has moved into the prescribed position on the building drum 1, the auxiliary drum 4 is uncoupled and moved axially away from the building drum.

#### WHAT WE CLAIM IS:—

1. An apparatus for placing annular rubberised parallel cord fabric bands, particularly carcass bands, on a tyre building drum, which comprises an auxiliary drum, for receiving the fabric bands which is mounted co-axially with respect to a tyre building drum and is arranged to be driven synchronously with it, a major part of the axial length of the auxiliary drum being frusto-conical having its radially outer surface inclined at an angle of up to  $5^\circ$  to the axis and diverging in the axial direction towards the tyre building drum.

2. An apparatus according to claim 1, in which the radially outer surface of the auxiliary drum forms an angle of from  $1^\circ$  to  $3^\circ$  with respect to the drum axis.

3. An apparatus according to claim 1 or 2, in which the auxiliary drum is frusto-conical over its entire axial length.

4. An apparatus according to claim 1, 2 or 3, in which radially outer surface of the auxiliary drum comprises a plurality of bars.

5. An apparatus according to claim 1, substantially as described herein with reference to the accompanying drawing.

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COMPLETE SPECIFICATION

1 SHEET

*This drawing is a reproduction of  
the Original on a reduced scale*

